DOCUMENT RESUME

ED 060 094 TM 001 252

TITLE	Dietitian 0-39.93 -- Technical Report on Standardization of the General Aptitude Test Battery. Final Report.
INSTITUTION	Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service.
REPORT NO	OSES-TR-S-55
PUB DATE	Aug 54
NOTE	8p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Aptitude Tests; *Cutting Scores; *Dietitians; Evaluation Criteria; Job Applicants; *Job Skills; Norms; Occupational Guidance; *Personnel Evaluation; Test Reliability; Test Validity
IDENTIFIERS	GATB; *General Aptitude Test Battery

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance . Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

ED 060094

FINAL REPORT

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

DIETITIAN 0-39.93

B-296 S-55

TM 001 252

U. S. Employment Service in
Cooperation with
Ohio State Employment Service

U. S. DEPARTMENT OF LABOR
Bureau of Employment Security
Washington 25, D. C.
August 1954

GATB #574
Spring 1950

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY FOR DIETITIAN O-39.93

B-296 S-55

Summary

The General Aptitude Test Battery, B-1001, was administered to a sample of 57 female Dietetic Interns undergoing training in seven Ohio hospitals. The participating hospitals were: The Christ Hospital, Cincinnati; Cincinnati General Hospital, Cincinnati; Good Samaritan Hospital, Cincinnati; Miami Valley Hospital, Dayton; The Ohio State University Hospital, Columbus; St. Luke's Hospital, Cleveland; and University Hospital, Cleveland. All of these hospitals have training courses approved by the American Dietetic Association. The interns in each hospital were rated in rank order by their respective Directors of Dietetics. The rank order ratings from each hospital were combined into broad categories for the final criterion. On the basis of mean scores, standard deviations, correlations with the criterion and job training and job analysis data, the following aptitudes were found to be significant: Intelligence (G), Verbal Aptitude (V) and Numerical Aptitude (N).

GATB Norms for Dietitian O-39.93 - B-296 S-55

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for Dietitian O-39.93.

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for B-296 S-55

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1-H CB-1-I CB-1-J	110	G	Part 3 Part 4 Part 6	105
V	CB-1-J	105	V	Part 4	105
N	CB-1-D CB-1-I	115	N	Part 2 Part 6	110

Effectiveness of Norms

The data in Table IV indicate that 9 of the 15 poor interns, or 60% of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. Moreover, 36 of the 42 interns who made qualifying test scores, or 86%, were good interns.

TECHNICAL REPORT

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Dietitian 0-39.93.

II. Sample

During the spring of 1950, the GATB was administered to 57 female dietetic interns in the seven Ohio hospitals that have training programs approved by the American Dietetic Association. The distribution of the interns in the participating hospitals is shown below:

Hospital	Location	Number of Interns
The Christ Hospital	Cincinnati	8
Cincinnati General Hospital	Cincinnati	6
Good Samaritan Hospital	Cincinnati	12
Miami Valley Hospital	Dayton	8
The Ohio State University Hospital	Columbus	12
St. Luke's Hospital	Cleveland	7
University Hospital	Cleveland	4

Each dietetic intern must hold a Bachelor's degree from an accredited college or university with a major in Foods and Nutrition or Institutional Management. Undergraduate courses required by the American Dietetic Association must also be completed. Upon successful completion of a twelve-month internship, a diploma is granted which makes interns eligible for membership in the American Dietetic Association. The training programs for interns of the participating hospitals are approved by the Council on Medical Education of the American Medical Association, by the Ohio Hospital Association and by the American Dietetic Association.

Table II shows the mean, standard deviation, range, Pearson product-moment correlation (corrected for broad categories) with the criterion and standard error of correlation for age.

TABLE II

Mean (M), Standard Deviation (σ), Range, and Pearson Product-Moment Correlation (Corrected for Broad Categories) with the Criterion ($_{c}r$) and the Standard Error of Correlation ($\sigma_{c}r$) for Age

Dietitian 0-39.93
N = 57

	M	σ	Range	$_{c}r$	$\sigma_{c}r$
Age (years)	23.7	3.0	21-36	.009	.132

There is no significant correlation between age and the criterion. The sample is more homogeneous with respect to age than the range indicates; only three of the interns were older than 26 years of age. There were no education or experience data available other than the fact that all of the tested interns held a Bachelor's degree from an accredited school.

III. Job Description

Job Title: Dietitian 0-39.93

Job Summary: Applies the principles of nutrition to the feeding of individuals and groups. Plans menus and special diets with proper nutritional value for a hospital, institution, school, restaurant or hotel. Determines dietetic values of foods and food products. Purchases food, equipment and supplies. Supervises chefs and other food service employees. Makes certain that sanitary conditions are maintained. Prepares educational nutrition materials.

Description of Intern Training Program

The five major areas of training described below constitute the intern training program in dietetics:

Food Administration. Learns to perform a variety of administrative and professional duties relative to planning, preparing and serving meals to hospital patients and personnel. Assists the dietitian-in-charge with menu planning. Learns techniques of food production and use of equipment in kitchen and supervises personnel engaged in food service and distribution. Receives training and experience in purchasing food and equipment. Learns accounting procedures relative to purchase of supplies. Prepares food cost reports, inventories and bi-monthly payroll for department employees. Participates in recruitment and training of new employees.

Therapeutic Nutrition. Studies theories underlying modifications of diets. Makes up selective diets for pathological conditions and adapts normal diet to restrictions of diabetic prescriptions. Secures nutrition histories and evaluates patients' eating habits to determine deficiencies or excesses.

Pediatrics. Learns principles of sterilization, types and uses of formulas and the philosophy behind food service. Studies techniques in feeding and development of children. Instructs children and their parents in principles of elementary nutrition.

Teaching. Plans and evaluates teaching procedures and teaching materials used in presenting lectures on diet therapy. Interprets reference readings for student nurses. Observes and presents lectures on normal nutrition and diet therapy to student nurses. Teaches laboratory classes in cookery.

Housekeeping. Learns proper use of kitchen equipment and organizes work efficiently. Maintains linen standards and linen control.

IV. Experimental Battery

All of the tests of the GATB, B-1001, were administered to the sample group.

V. Criterion

All of the dietetic interns were rated by their respective Directors of Dietetics. The American Dietetic Association has adapted for use in approved hospitals "Evaluation Scales for Rating Student Dietitians." These scales include five units pertaining to the students' accomplishments in five specific areas of work; one unit pertaining to the personal and professional qualities of the students; and the seventh unit is a Summary, giving an over-all rating on each unit and a composite over-all rating covering all the units.

All of the dietetic interns could not be rated on either the same number of units of work or areas of training i.e., I. Food Administration, II. Nutrition, III. Teaching, IV. Infant Feeding, and V. Housekeeping. This was due to two facts: first, hospitals do not uniformly begin classes on the same date; secondly, interns are not assigned to training in the various areas at the same time. Since it would be several months before ratings would be complete for all areas of training and because of the inclusion of interest and personality factors in so many of the scales, it was decided that the most acceptable criterion data could be obtained from the Directors of Dietetics in the form of over-all ratings. In addition to the over-all ratings, the names of those students who were outstandingly good and those that were just passing were obtained from the directors. The ratings were in rank order.

Ratings by the directors should be fairly representative of the interns' relative success in training for several reasons. The groups are small, which gives the directors the opportunity to know the students intimately, to observe them closely and to integrate their knowledge with information received from supervisors and reports. The directors must make out the American Dietetic Association's evaluation ratings for specific units and areas of work within a unit, which tends to make their thinking concerning an intern more objective and based on factual evidence. The training is carried on in an operating situation in which responsibility is given to the interns, and for which schedules must be met and food preparation activities must be conducted. This allows the Directors of Dietetics to observe the interns in practical or working situations which tends to make their ratings more valid.

The rank order ratings made by the Directors of Dietetics were used as the basis for combining the criterion data obtained from each hospital. The best 25 percent of each group, or those whom the raters selected as "outstanding" were grouped together; the same was done with the lowest 25 percent of each group, or those whom the raters selected as "just passing" interns; the middle 50 percent were similarly grouped together. The three broad category groupings were converted to quantitative scores for computational purposes.

VI. Statistical and Qualitative Analysis

Table III shows means, standard deviations, Pearson product-moment correlations (corrected for broad categories) with the criterion and standard errors of correlation for the aptitudes of the GATB.

The means and standard deviations of the aptitudes are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion ($_{c}r$) and Standard Errors of Correlation ($\sigma_{c}r$) for the Aptitudes of the GATB

Dietitian 0-39.93
N = 57

Aptitudes	M	σ	$_{c}r$	$\sigma_{c}r$
G-Intelligence	127.6	13.2	.616**	.082
V-Verbal Aptitude	121.6	13.9	.434**	.108
N-Numerical Aptitude	126.1	12.8	.542**	.094
S-Spatial Aptitude	116.8	16.1	.479**	.102
P-Form Perception	124.5	15.5	.387**	.113
Q-Clerical Perception	124.1	15.8	.402**	.111
A-Aiming	118.0	16.0	.435**	.107
T-Motor Speed	114.3	17.9	.351**	.116
F-Finger Dexterity	112.1	18.3	.578**	.088
M-Manual Dexterity	107.7	20.7	.247	.124

**Significant at the .01 level.

The statistical results were interpreted in the light of the job analysis data. The job analysis indicated that the following aptitudes measured by the GATB are important for this occupation:

Intelligence (G) - required in applying principles of food planning with consideration for nutritional requirements; organizing the work load for the most efficient use of labor; studying theories underlying modifications of diets and making up selective diets; planning and evaluating teaching procedures and teaching materials used in presenting lectures on diet therapy; and interpreting reference readings for student nurses.

Verbal Aptitude (V) - required in the training of new employees; instructing children and adults in the principles of elementary nutrition; presenting lectures on normal nutrition and diet therapy; and in teaching laboratory classes.

Numerical Aptitude (N) - required in calculating a bi-monthly payroll and occasionally the weekly food cost reports; and in making calculations involved in planning various types of diets.

Clerical Perception (Q) - required for accuracy in checking diet requisitions; assisting in maintaining a perpetual inventory and checking charges to the accounting department.

The highest mean scores in order of magnitude were obtained for Aptitudes G, N, P, Q and V, respectively. Aptitudes G, V and N have the lowest standard deviations, although all of the aptitudes with the exception of M, have standard deviations of less than 20.

When N = 57, correlations of .339 and .261 are significant at the .01 level and .05 level, respectively. All of the aptitudes with the exception of M, have significant correlations with the criterion at the .01 level of confidence.

On the basis of mean scores, low standard deviations, significant correlations and importance as indicated in the job training analysis, Aptitudes G, V and N were included in the test norms.

Although Aptitude Q has a high mean score, significant correlation with the criterion and is indicated as important in the job analysis, it reduced the selective efficiency when added to norms which included Aptitudes G, V and N; in addition it was found that norms which included Aptitudes G, V and N yielded better selective efficiency than norms which included Aptitudes G, N and Q. Therefore, Aptitude Q was omitted from the norms. There was some statistical evidence to warrant consideration of Aptitudes P, S, A and F for inclusion in the norms, however, these aptitudes did not appear to be as important as Aptitudes G, V and N in terms of overall qualitative and quantitative considerations and were, therefore, omitted from the norms.

The cutting scores for Aptitudes G and V were set at one sigma below their respective means and rounded to the lower adjacent five point score levels. The cutting score for Aptitude N was set at one sigma below the mean and rounded to the nearest five point score level. Setting cutting scores at these levels yielded the best selective efficiency for the norms and resulted in critical scores of 110, 105 and 115, for Aptitudes G, V, and N, respectively.

For the purpose of computing the tetrachoric correlation coefficient and Chi Square, the criterion was dichotomized with those interns who were rated in approximately the lowest 25 percent of the sample placed in the low criterion group and designated as "poor interns." The other interns were placed in the high criterion group and designated as "good interns." The relationship between norms consisting of G-110, V-105 and N-115 and the dichotomized criterion is shown in Table IV.

TABLE IV

Relationship between Test Norms Consisting of Aptitudes G, V, and N with Critical Scores of 110, 105, and 115, Respectively and Criterion for Dietitian 0-39.93

N = 57

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Interns	6	36	42
Poor Interns	9	6	15
Total	15	42	57

$r_{tet} = .71$ $\quad X^2 = 9.671$

$\sigma_{r_{tet}} = .24$ $\quad P/2 < .005$

The data in the above table indicate a high and significant relationship between the norms and the criterion for this sample.

VII. Conclusions

On the basis of job analysis data, mean scores, correlations with the criterion and their combined predictive efficiency, Aptitudes G, V, and N with minimum scores of 110, 105 and 115, respectively, are recommended as B-1001 test norms for the occupation of Dietitian 0-39.93. Equivalent B-1002 norms consist of G-105, V-105 and N-110.